UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/614,316	07/07/2003	Prateek Arora	16INC0159	8275

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EXAMINER
TUCKER, WESLEY J

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 May 2008*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a)☒ All   b)☐ Some * c)☐ None of:

       1.☒ Certified copies of the priority documents have been received.

       2.☐ Certified copies of the priority documents have been received in Application No. _____.

       3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
     Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1.   A request for continued examination under 37 CFR 1.114, including the

fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since

this application is eligible for continued examination under 37 CFR 1.114, and the fee

set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office

action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on

May 13th 2008 has been entered.

Response to Arguments

2.   Applicant's response filed January 1st 2008 has been entered and made of

record.

3.   Applicant has amended no claims. Claims 1-8 are pending.

4.   Applicant's remarks have been fully considered but are not found

persuasive for at least the following reasons:

Applicant repeats arguments similar to those submitted and addressed already in

the Final Office Action filed November 14th 2007.

Applicant argues Wyman does not disclose or suggest selecting a candidate

image, which shares the largest amount of mutual information with the reference image,

from among the plurality of candidate images. Examiner disagrees and points to the

cited passages in the rejection. Wyman discloses the image that matches the most

data is selected at step 450, col. I0 lines 8-13. See also column 4, lines 44-46. Wyman discloses that mutual information is used to determine closeness of fit; the closeness of fit being the best when the largest amount of mutual information is shared between the images. It should also be noted that the candidate images in Wyman are interpreted as the images in each of their different forms of transformation. The image or image set determined to be in alignment is interpreted to be the selected candidate image as it or they share the most mutual information with the reference image or images.

Applicant further argues that the secondary reference to Ayala does not disclose elements of the claim addressed by the primary reference to Wyman. Let it be clear that reference to Ayala is only cited to teach the use of granulometry. Ayala discloses using granulometry on page 1430 2nd column, lines 6-11 and under section 3 starting on page 1431. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Ayala with Wyman. The motivation for doing so is to classify the image data (so that when MRI image (reference image) in Wyman is used to compare with the CT images (candidate images), the candidate images are classified by its patterns to find the closest match to the reference image) and to make a distinction by pattern analysis of the mathematical morphology as suggested by Ayala. Therefore, it would have been obvious to combine Ayala with Wyman to obtain the invention as specified in claim 1.

The combination of Wyman and Ayala teaches the claimed elements of independent claims 1 and 5. The rejection in view of Wyman and Ayala is accordingly maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.   Claims 1, 3-5 and 7-8 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Wyman et al. (US 7,106,891) (hereinafter, "Wyman") in view of Ayala

et ai. ("Spatial Size Distributions: Applications to Shape and Texture Analysis," IEEE,

December 2001, pp. 1430- 1442) (hereinafter, "Ayala").

With regard to claim 1, Wyman discloses ***an image processing method*** (Figure

4) ***comprising the steps of:***

extracting a plurality of candidate images similar to a reference image from

among a plurality of images (col. 8 lines 62-63 receiving images from MR] 105 and

CT 110, col. 7 lines 44-60. See also column 4, lines 56-65. Wyman discloses that the

sets of images may be sets of one image or many);

transforming the plurality of candidate images on the basis of the reference

image (step 425 of transformation, col. 9 lines 31-42);

calculating mutual information shared by each of the transformed

candidate images and the reference image (steps 430 and 440, col. 10 lines 5-47.

See also column 4, lines 44-46. Wyman discloses that mutual information is used to determine closeness of fit);

and selecting a candidate image, which shares the largest amount of mutual information with the reference image, from among the plurality of candidate images (the image that matches the most data is selected at step 450, col. l0 lines 8-13. See also column 4, lines 44-46. Wyman discloses that mutual information is used to determine closeness of fit; the closeness of fit being the best when the largest amount of mutual information is shared between the images. The candidate images in Wyman are interpreted as the images in each of their different forms of transformation. The image or image set determined to be in alignment is interpreted to be the selected candidate image as it or they share the most mutual information with the reference image or images).

Wyman does not expressly disclose utilizing granulometry. Ayala discloses this on page 1430 2nd column, lines 6-11 and under section 3 starting on page 1431. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Ayala with Wyman. The motivation for doing so is to classify the image data (so that when MRI image (reference image) in Wyman is used to compare with the CT images (candidate images), the candidate images are classified by its patterns to find the closest match to the reference image) and to make a distinction by pattern analysis of the mathematical morphology as suggested by Ayala. Therefore, it would have been obvious to combine Ayala with Wyman to obtain the invention as specified in claim 1.

With regard to claim 3 Wyman discloses transformation includes alignment of barycenters (Figure 5 and col. 10 line 48 to col. 11 lines 1-3).

With regard to claim 4 Wyman discloses reference image and the candidate images are medical images (col. 7 lines 50-59).

Claim 5 recites identical features as claim 1 except claim 5 is an apparatus claim. Thus, arguments similar to that presented above for claim 1 is equally applicable to claim 5. Applicants' attention is invited to Figures 1, 3 and 6 where an apparatus for the method is illustrated.

Claim 7 recites identical features as claim 3 except claim 7 is an apparatus claim. Thus, arguments similar to that presented above for claim 3 is equally applicable to claim 7.

Claim 8 recites identical features as claim 4 except claim 8 is an apparatus claim. Thus, arguments similar to that presented above for claim 4 is equally applicable to claim 8.

6.   Claims 2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wyman et al. (US 7,106,891) (hereinafter, "Wyman")in view of Ayala et al. ("Spatial Size Distributions: Applications to Shape and Texture Analysis," IEEE, December 2001, pp. 1430-1442) (hereinafter, "Ayala") as applied to claims 1, 3-5 and 7-8 above, and further in view of Nakajima et al. (US 5,623,560) (hereinafter, "Nakajima").

With regard to claim 2 Wyman (modified by Ayala) discloses an image processing method as disclosed above in claim 1 and the arguments are not repeated herein, but are incorporated by reference. Neither Wyman nor Ayala expressly disclose having transformation include matching of magnification. Nakajima discloses this at col. 14 line 41 to col. 15 lines 1-6. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teaching of Nakajima with Ayala and Wyman. The motivation for doing so is to have the reference and the candidate image be aligned for matching (please notice that Wyman does this correction by magnification also, however, by zooming out at col. 8 lines 9 and 25) as suggested by Nakajima. Therefore, it would have been obvious to combine Nakajima with Ayala and Wyman to obtain the invention as specified in claim 2.

Claim 6 recites identical features as claim 2 except claim 6 is an apparatus claim. Thus, arguments similar to that presented above for claim 2 is equally applicable to claim 6.

Contact Information

7.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to WESLEY TUCKER whose telephone number is (571)272-7427. The examiner can normally be reached on 9AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Bella can be reached on 571-272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Wes Tucker/
Examiner, Art Unit 2624